

ART. II.—*New or Little-known Fossils in the National Museum. Part XXX.—A Silurian Jelly-fish.*

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(With Plates I. and II.)

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Introduction.

Probably hardly anything in the province of fossil discovery that has come within my ken during the past forty-five years equals in interest and wonder that of a beautifully preserved jelly-fish in the Silurian mudstone of Brunswick, Victoria.

It was at about the same spot, but on a higher horizon of the Silurian, that a marvellously preserved cast of a crinoid, *Helicocrinus plumosus* (1, p. 108, pls. xvii., xviii.) was found twenty-four years previously. Only for the care and interest of the two workmen who found these respective fossils are we able to include them among the treasures of the National Museum.

Description of the Fossil.

Class HYDROZOA.

Sub-Class SCYPHOMEDUSAE.

Order DISCOPHORA.

Genus *Discophyllum*, J. Hall, 1847.

DISCOPHYLLUM MIRABILE, sp. nov.

(Plates I. and II.)

The Holotype.

The circular form of the umbrella is distinctly shown, and only a little distorted by pressure. The diameter of this portion is 118 mm. The total probable diameter, including the tentacles, is 168 mm., or about $6\frac{1}{2}$ inches.

The radials of the umbrella are seen as perfect ridges in the fossil, and therefore there has been the least amount of compression compatible with its preservation. The number of radial

ridges on the umbrella is about 56. These are rounded to roundly depressed, and are crossed by strong, concentric ridges that bear a composite undulate ornament. The frilled ribs extend practically to the centre of the umbrella.

Where the external covering has been broken through, or is thin, there are seen the four gastro-genital pouches arranged in a cruciform manner just as in a modern *Aurellia*.¹ These pouches are more or less cuspidate in outline.

The tentacles are seen as a zone of delicate, threadlike, carbonaceous stains surrounding the umbrella, and appear to become more visible in a photograph. They are of two kinds, those which emanate from the termination of the ribs are strong, and seem to be grooved, whilst the interspace is filled in with multitudes of finer tentacles. The tentacles extend beyond the umbrella margin for about 25 mm.

The central part of the disc was apparently more strongly convex, so that the central diameter, of about 64 mm., is marked off as with a depressed ring. It is within this central zone that the pouches are confined. The concentric ridges are seen to interdigitate on the sides of the radials, so that there is left in the radial furrow a lenticular pit. This arrangement imparts a beautiful undulose ornamentation to the umbrella surface.

Note on the Paratype.

It was fortunate that the counterpart of the fossil was also secured (purchased by Mr. F. A. Cudmore), for this gives some details not seen in the holotype; and we are indebted to Mr. Cudmore for the loan of this specimen.

The central part of the disc in the paratype is perfectly shown by a fine impression of the radials emanating from a clear apical spot in the centre. This apical spot has a diameter of 4 mm. The surrounding ring of radials is very delicate, and the striate ridges, at a diameter of 11 mm., bifurcate into the stronger ridges that pass over the general area of the disc.

Towards one side of the paratype there appears to be distinct evidence of the impression of the manubrium. This is represented by a pendent cluster of divergent and crenulated ridges, which suggest a depressed tubular structure lying within the central disc.

Relationship of the Fossil.

So far, I have been unable to find more than one other described jelly-fish which can be compared with the present specimen. It is the *Discophyllum peltatum* of James Hall (2, p. 277, pl. lxxv., fig. 3). The resemblance of this species is so close to the Victorian specimen that it is clearly congeneric. Hall's species

1.—Usually referred to as *Aurelia*, Agassiz, 1862. Correctly as *Aurellia*, Peron and Lesueur, 1809.

was found in the Trenton Series at Troy, New York State. When described, James Hall placed it with the corals. Scudder, in his Index, referred it to the graptolites (3). Later on, Dr. Chas. D. Walcott included it in his fine Monograph on "Fossil Medusae" (4, p. 101, pl. xlvii., figs. 1, 2), and not only replaced the original figure by a better, but figured an additional example from the same locality. These figures leave no shadow of a doubt that they and the Australian specimens are similar in every morphological particular, so far as the genus goes.

In re-describing the Trenton specimen, Dr. Walcott says (4, p. 101): "It is exceedingly difficult to determine whether *D. peltatum* is the impression of a medusa. There is no *a priori* reason why a gelatinous disc should not leave such an impression in the very fine arenaceous silt which now forms the slightly gritty layers embedded in the shales carrying the graptolitic fauna referred to the Trenton terrane. If *D. peltatum* be considered to be the cast of the impression of a medusa, it might be grouped with *Medusina princeps* as an acraspedote medusa."

The close affinities of the Victorian and American species leave little doubt that they both belong to the fringed Scyphozoa, but that the tenuity of the marginal tentacles accounts for their absence in the American specimens, which were preserved in a fine sandy matrix; whereas the Victorian occurs in an impalpable, blue mudstone.

Dr. C. D. Walcott has figured a second specimen of James Hall's species (*Discophyllum peltatum*), and this shows more of the distinctive characters than the original type. There are about 72 radial ridges as against 56 in the Victorian fossil, and they bear a similar ornamentation to each other. As in the Victorian fossil, the Troy specimen shows a distinct central area, although perhaps not so much in relief; it does not, however, afford any convincing evidence of gastro-genital pouches, although some irregular depressions on both the American specimens may indicate their position.

A. G. Mayer, in his "Medusae of the World" (5), does not refer to Hall's *Discophyllum peltatum*, when listing the fossil jelly-fishes, although he enumerates most of the species which have a claim to such origin. Incidentally we may note, however, that he accepts Walcott's interpretation of Torrell's fossil (*Medusina costata*), from the Lower Cambrian of Esthonia, as a probable *Aurellia*.

Occurrence and Age.

This fossil was found by Mr. R. Evans in the blue mudstone of the Silurian (Melbournian) series at Brunswick, north of Melbourne. It was very fortunate that it fell into the hands of a careful collector like Mr. Evans, who, by the way, had previously brought some very interesting fossils to the National Museum.

The bed in which this fossil was found is near the base of the clay pit, at a depth of about 100 feet. It is an exceedingly fine-grained mudstone, that has proved an ideal matrix for a delicate structure such as this. There is no difficulty, to my mind, why a soft body like a jelly-fish should have been preserved as a cast and impression in relief, for when the fine ooze settled down upon the gelatinous body, the latter would be sufficiently rigid to withstand complete pressure, and the succeeding layers would help to distribute the pressure over and away from that particular point. When once the matrix had been fairly compacted there would be no further compression. A noteworthy feature of the bed in which the fossil was found is its horizontality, or if folded, only in the slightest degree.

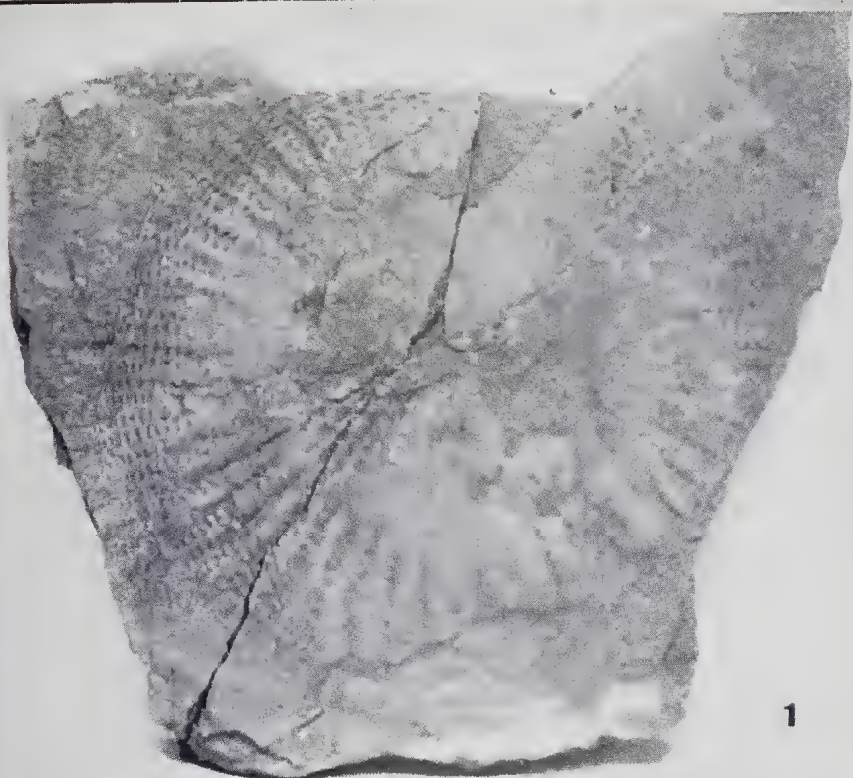
A face of the clay-pit shows 26 feet of Tertiary (Kalimnan) sand at the top, below which is the Silurian brown mudstone for about 45 feet. Beneath this, in the deepest part, is about 58 feet of blue mudstone and sandstone. It may be remarked that the upper brown bed is more typically Melbournian, and it is quite possible that the blue bed is one of the lowest zones of the Silurian yet reached. In this pit the stratification is almost horizontal, there being only a slight dip towards the boundary of the excavation, and at one end a dip of about 30°.

Associated Fauna and Flora.

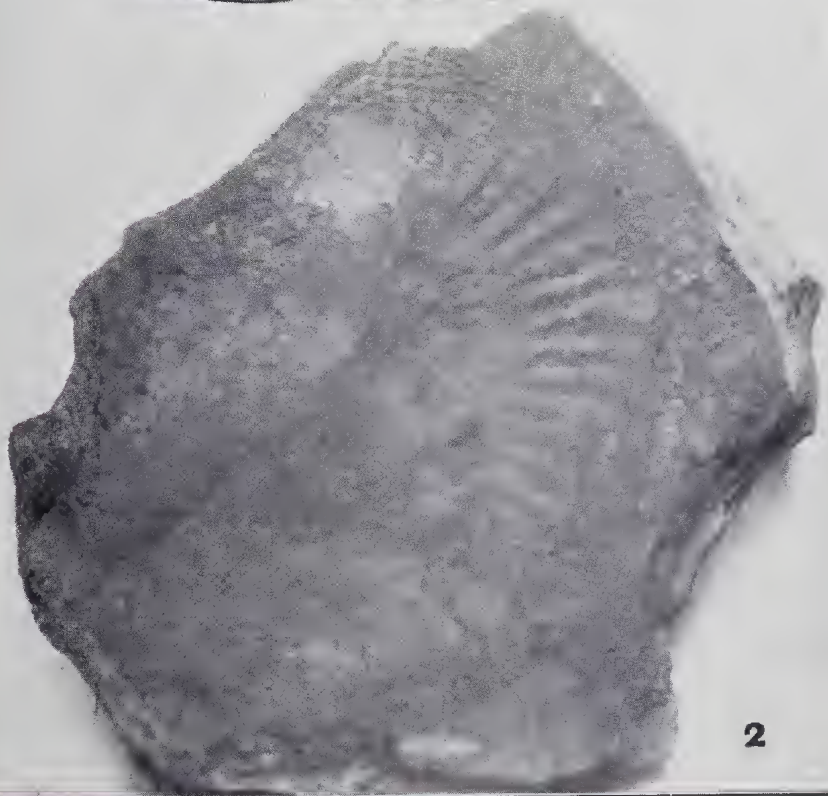
From a more sandy bed near the place where the jelly-fish occurred, there was obtained a beautiful specimen of the seaweed, *Bythotrephis gracilis* J. Hall. A description of this specimen is in course of publication, from the pen of Mr. A. J. Lucas. This well-known authority on algae is convinced of the true algal affinities of the fossil, and says that it differs very little from some forms found at the present day.

In other parts of the more sandy rock in this pit were found the remains of:—

Algae.	<i>Bythotrephis gracilis</i> J. Hall sp., and several other algae, not yet determined.
Brachiopoda.	<i>Camarotoechia</i> sp. <i>Nucleospira australis</i> McCoy.
Gasteropoda.	<i>Euomphalus</i> sp. <i>Bellerophon</i> sp. <i>Conularia</i> sp.
Cephalopoda.	? <i>Endoceras</i> sp. ? <i>Ooceras</i> sp.
Trilobita.	<i>Calymene</i> sp. <i>Encrinurus</i> sp.



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